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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,691	02/10/2004	Tuomo Lehtonen	59244.00009	7362
32294	7590	10/11/2006	EXAMINER	
SQUIRE, SANDERS & DEMPSEY L.L.P.			CHAPMAN JR, JOHN E	
14TH FLOOR			ART UNIT	
8000 TOWERS CRESCENT			PAPER NUMBER	
TYSONS CORNER, VA 22182			2856	

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/774,691

Applicant(s)

LEHTONEN, TUOMO

Examiner

John E. Chapman

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,17,19-22,24 and 26-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,17,19-22,24 and 26-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the drop like and hammer like pairs of electrodes (claim 3) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 31 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not adequately teach one of ordinary skill in the art how to select a total number of pairs of electrodes and orientations such that a change in capacitance is linearized.

4. Claims 1, 3, 17, 19-22, 24 and 26-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the import of “wherein the position of the pair of electrodes is arranged symmetrically” in lines 11-12 is unclear. At that point in the claim, there is antecedent basis for only a pair of electrodes. But if there is only one pair of electrodes, then it is not clear what it means to be “arranged symmetrically.” Arranged symmetrically with respect to what? As best understood from the specification, pairs of electrodes are arranged symmetrically with respect to an axis of symmetry. Note paragraph 47. It is not clear what is meant for a single pair to be “arranged symmetrically.” While additional pairs of electrodes are introduced in lines 14-15, it is not clear that the first pair of electrodes is “arranged symmetrically” with respect to the additional pairs of electrodes.

Art Unit: 2856

5. Claims 1, 24, 26-28 and 30 are rejected under 35 U.S.C. 102(b) as anticipated by Andersson (5,723,790).

Andersson discloses an acceleration sensor comprising four cantilevered beams 1, 2, 3 and 4 with adhering masses of inertia 1', 2', 3' and 4'. Andersson teaches a Type II measuring device in Fig. 5 wherein the masses of inertia 1', 2', 3' and 4' are arranged symmetrically in relation to axes of symmetry and the negative direction vectors (i.e., the directions from the masses of inertia through the support axes of the beams) intersect at essentially one point. The sensor comprises a multi-axis acceleration sensor (column 3, lines 35-37). Andersson further teaches that the sensor may comprise a capacitive sensor wherein conductive surfaces are located on opposite sides of the masses of inertia (column 4, lines 1-4). The masses of inertia 1', 2', 3' and 4' comprise movable electrodes that are rigidly supported for rotational motion about the hinge axis of the cantilevered beams 1, 2, 3 and 4.

Regarding claim 24, each inertia mass 1', 2', 3' and 4' comprises two pairs of electrodes, since electrodes are located on opposite sides of the masses of inertia. Hence, there are eight pairs of electrodes.

Regarding claim 26, since the acceleration sensor measures acceleration along three axes (column 3, lines 35-37), it thereby measures acceleration along two axes.

Regarding claim 30, some of the pairs of electrodes are redundant since they measure the same quantity, for example,  $F_x$  in Fig. 4.

6. Claims 3, 17, 19-22 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson.

Regarding claim 3, the cantilever beam 1 with inertia mass 1' would suggest a "hammer-like" electrode in that the cantilever beam 1 resembles a hammer handle and the inertia mass 1' resembles a hammer head. A mere change in the shape of a prior art device is generally recognized as a design consideration within the skill of the art. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Regarding claim 17, it would have been obvious to use a simple capacitor comprising a single fixed conductive surface in lieu of a differential capacitor comprising a pair of conductive surfaces. The omission of an element and its function in a combination, where the remaining elements perform the same functions as before, involves only routine skill in the art. *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975); *In re Karlson*, 311 F.2d 581, 136 USPQ 184 (CCPA 1963).

Regarding claim 19, since the acceleration sensor measures acceleration along three axes (column 3, lines 35-37), it thereby measures acceleration along two axes.

Regarding claim 30, it would have been obvious to provide redundant sensors in case one sensor should become inoperative. It is well settled that the mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

7. Claims 24 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson in view of Negoro (5,892,154).

Regarding claim 24, insofar as claim 24 recites eight pairs of electrodes, each pair comprising a moveable electrode distinct from the other moveable electrodes, Negoro teaches

Art Unit: 2856

forming a capacitive acceleration sensor using  $N$  acceleration detection devices, where  $N \geq 3$  (column 14, lines 19-29). It would have been obvious to one of ordinary skill in the art to choose  $N = 8$ . Where the prior art discloses a range of values (such as,  $N \geq 3$ ), and there is no showing of criticality of the recited range (such as,  $N = 8$ ), such recited range is generally considered to be obvious to one of ordinary skill in the art. See *In re Reven*, 390 F.2d 997, 156 USPQ 679 (CCPA 1968).

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson in view of Cole (4,736,629).

Regarding claim 29, the only difference between the claimed invention and the prior art consists in measuring different ranges of acceleration. Cole teaches forming the beams 148 and 150 such that the beams have different moments about the pedestal, i.e., such that they measure different ranges of acceleration. It would have been obvious in view of Cole to provide the cantilevered beams 1, 2, 3 and 4 of Andersson with different moments so as to measure different ranges of acceleration.

9. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson in view of Menzel (5,900,550).

Regarding claim 31, it is well known within the art to provide linearization in order that the output signal is proportional to the input acceleration. Menzel is cited as evidence that it is well known in the art to optimize the linearity of a capacitive acceleration sensor. Note column 1, lines 46-47.

10. Applicant's arguments filed August 25, 2006 have been fully considered but they are not persuasive. Applicant argues that paragraphs [0053] to [0055] of the specification detail how pairs of electrodes can be used to linearize the capacitance change. However, paragraph [0053] simply asserts that "some of the pairs of electrodes can be used for linearisation of the capacitance change." Which pairs of electrodes, and how they are used to linearize the capacitance change, is not made clear. Paragraph [0054] and [0055] nowhere mention linearizing the capacitance change. Paragraph [0054] refers to Fig. 10, and paragraph [0055] refers to Fig. 11. It is not clear whether the arrangement and/or shape of the pairs of electrodes in the figures serve to linearize the capacitance change, or whether additional structure is required. Applicant does not argue that linearization is inherent in the arrangements of Figs. 10 and 11. Hence, it is not clear whether one skilled in the art is to linearize the change in capacitance output of the acceleration sensor by selecting the total number of pairs of electrodes and orientations as illustrated in Figs. 10 or 11, or by providing additional structure. Applicant argues: "What is noticeably absent from the Office Action's argument is any evidence or even assertion that one of ordinary skill in the art would not know how the pairs of electrodes can be used for linearization of the capacitive change." However, the Office action stated: "The specification does not adequately teach how to linearize the output of the acceleration sensor with respect to a change in capacitance by selecting a number of pairs of electrodes and their orientations." The issue is not whether one of ordinary skill in the art would know how pairs of electrodes can be used for linearization of the capacitive change, but rather whether one of ordinary skill in the art would know based upon applicant's disclosure how pairs of electrodes



Art Unit: 2856

can be used for linearization of the capacitive change. As indicated above, it is not clear from applicant's disclosure whether one skilled in the art is to linearize the change in capacitance output of the acceleration sensor by selecting the total number of pairs of electrodes and orientations as illustrated in Figs. 10 or 11, or by providing additional structure. The purpose of the specification is to provide a disclosure of the claimed invention and not a guessing game.

Applicant argues: "Andersson does not disclose or suggest a capacitive acceleration sensor, but instead describes sensing acceleration using piezoelectric and vibrating gyro principles." However, Andersson clearly discloses detection of movements of masses of inertia 1', 2', 3' and 4' capacitively. See column 8, lines 27-40. Accordingly, Andersson clearly discloses a capacitive acceleration sensor. Consequently, applicant's argument that "the approach of Andersson is radically different from and inconsistent with the claimed approach to measuring acceleration, and thus it is not from the same field of endeavor and is nonanalogous art" is without merit.

With regard to claim 3, Applicant argues that there is evidence in the specification that the shape of the electrodes is significant and Applicant refers to paragraph [0048]. However, paragraph [0048] states: "The shape of the pairs of electrodes of the acceleration sensor is selected to suit the number of pairs of electrodes, whereby an optimal packing density is achieved by utilizing the shapes and positioning of the mass items." It is not clear that the shape of the pair of electrodes recited in claim 3 is utilized to achieve an optimal packing density.

Applicant argues: "Andersson cannot be used to show obviousness of the claimed invention, because Andersson is both non-analogous art to the present invention, and because Andersson is non-analogous art to Negoro." As indicated above, Andersson clearly teaches

Art Unit: 2856

detection of movements of masses of inertia 1', 2', 3' and 4' capacitively in column 8, lines 27-40. Accordingly, Andersson is both analogous art to the present invention and analogous art to Negoro.

Applicant argues that "one of ordinary skill in the art would not be motivated to combine Andersson and Negoro [Cole], because they are non-analogous and from different fields of endeavor." As indicated above, Andersson clearly teaches detection of movements of masses of inertia 1', 2', 3' and 4' capacitively in column 8, lines 27-40. Accordingly, Andersson is analogous art to both Negoro and Cole.

Applicant argues that the recitation of claims 30 and 31 are not "capable of instant and unquestionable demonstration." *In re Harza* is cited as evidence that the subject matter of claim 30 is "capable of instant and unquestionable demonstration." Menzel (5,900,550) is cited as evidence that the subject matter of claim 30 is "capable of instant and unquestionable demonstration."

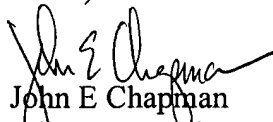
11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John E. Chapman whose telephone number is (571) 272-2191. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
John E Chapman  
Primary Examiner  
Art Unit 2856